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VERIFICATION OF TRANSLATION

Sir;

The undersigned hereby stases that the attached English language patent application is an accurate translation of the Japanese language document filed on January 30, 2003, and assigned Serial No. 2003-022256.

Dated: May 30, 2005 Signed: _____

Printed Name: Kiyoshi Kawakubo

(Japanese Patent Application No. 2003-022256)

[Name of Document] Specification

[Title of the Invention] PRINTING APPARATUS

[Scope of Claim]

[Claim 1] A printing apparatus which performs printing based on print data sent from a host computer and in which a user interface to be operated by a user is eliminated, comprising:

a connection interface which connects the printing apparatus to a peripheral device including the host computer;

connection object detection means for detecting a connection object of the connection interface;

mode setting means for setting a print mode, depending on the detected connection object, to either a normal print mode in which printing is performed based on the print data sent from the host computer, or a demonstration print mode in which printing is performed based on demonstration print data which is stored in advance; and

demonstration printing means for performing demonstration printing on a print medium with a specific operation by the user serving as a trigger therefor when the print mode is set to the demonstration print mode,

wherein the mode setting means sets the print mode to the normal print mode when the connection object is the host computer and to the demonstration print mode when the connection object is not the host computer or when there exists no connection object.

[Claim 2] The printing apparatus as set forth in claim 1, wherein the connection object detection means detects the connection object when power is supplied.

[Claim 3] The printing apparatus as set forth in

claim 1, wherein the connection object detection means detects the connection object when the print medium is mounted.

[Claim 4] The printing apparatus as set forth in claim 1, wherein the connection object detection means detects the connection object when the connection object is connected.

[Claim 5] The printing apparatus as set forth in any one of claims 1 through 4, wherein the mode setting means sets the print mode to the demonstration print mode when the connection object is an attachment exclusively used for the demonstration printing.

[claim 6] The printing apparatus as set forth in any one of claims 1 through 4, wherein the specific operation includes an operation of supplying power.

[Claim 7] The printing apparatus as set forth in any one of claims 1 through 6, wherein the specific operation includes an operation of mounting the print medium.

[Claim 8] The printing apparatus as set forth in claim 1, 4, 5, 6 or 7, wherein the specific operation includes an operation of connecting the connection object.

[Claim 9] The printing apparatus as set forth in claim 3, wherein the print medium is a tape, further comprising:

a tape cartridge mounting portion for mounting a tape cartridge having housed therein the tape in a state of being wound,

wherein the tape cartridge mounting portion has a lid member which is for closing after the tape cartridge is mounted, and

wherein the connection object detection means

detects the connection object when the lid member is closed.

[Claim 10] The printing apparatus as set forth in claim 9, wherein the specific operation includes an operation of closing the lid member.

[Claim 11] The printing apparatus as set forth in any one of claims 1 through 8, wherein the print medium is a discoid write-once optical disk.

[Claim 12] A printing apparatus which performs printing based on print data sent form a host computer, comprising:

print medium detection means for detecting a kind of a print medium mounted on the printing apparatus;

mode setting means for setting a print mode to either a normal print mode in which printing is performed based on the print data received from the host computer, depending on the detected kind of the print medium, or a demonstration print mode in which printing is performed based on demonstration print data which is stored in advance; and

demonstration printing means for performing demonstration printing on the print medium with a specific operation by a user serving as a trigger therefor when the print mode is set to the demonstration print mode.

[Claim 13] The printing apparatus as set forth in claim 12, wherein the print medium detection means detects the print medium when power is supplied.

[Claim 14] The printing apparatus as set forth in claim 12, wherein the print medium detection means detects the print medium when the print medium is mounted.

[Claim 15] The printing apparatus as set forth in

claim 12, 13 or 14, wherein a user interface to be operated by a user is eliminated.

[Claim 16] The printing apparatus as set forth in claim 12, 13 or 14, further comprising a print execution key by which the user instructs execution of printing,

wherein the print medium detection means detects the print medium when the print execution key is depressed by the user.

[Claim 17] The printing apparatus as set forth in claim 16, wherein the specific operation includes an operation of depressing the print execution key.

[Claim 18] The printing apparatus as set forth in any one of claims 12 through 17, wherein the specific operation includes an operation of supplying power.

[Claim 19] The printing apparatus as set forth in claim 12, 14, 15, 16, 17 or 18, wherein the specific operation includes an operation of mounting the print medium.

[Claim 20] The printing apparatus as set forth in claim 14, wherein the print medium is a tape, further comprising:

a tape cartridge mounting portion for mounting a tape cartridge having housed therein the tape in a state of being wound,

wherein the tape cartridge mounting portion has a lid member which is for closing after the tape cartridge is mounted, and

wherein the print medium detection means detects the kind of the tape cartridge when the lid member is closed.

[Claim 21] The printing apparatus as set forth in claim 20, wherein the specific operation includes an

operation of closing the lid member.

[Claim 22] The printing apparatus as set forth in any one of claims 12 through 19, wherein the print medium is a discoid write-once optical disk.

[Claim 23] The printing apparatus as set forth in claim 12, 15, 16, 17, 18, 20, 21 or 22, further comprising:

a connection interface which connects the printing apparatus to a peripheral device including the host computer; and

connection object detection means for detecting a connection object of the connection interface,

wherein, when the connection object is the host computer, the mode setting means sets the print mode to the normal print mode irrespective of the mounted print medium.

[Claim 24] The printing apparatus as set forth in claim 23, wherein, when the connection object detected by the connection object detection means is an attachment exclusively used for demonstration printing, the mode setting means sets the print mode to the demonstration print mode irrespective of the mounted print medium.

[Claim 25] The printing apparatus as set forth in claim 23 or 24, wherein, when the print medium detected by the print medium detection means is a specific print medium, the mode setting means sets the print mode to the demonstration print mode irrespective of the connection object detected by the connection object detection means.

[Claim 26] The printing apparatus as set forth in claim 23, 24 or 25, wherein the specific operation includes an operation of connecting the connection object.

[Claim 27] The printing apparatus as set forth in any one of claims 1 through 26, wherein, after setting the print mode to the demonstration print mode, the mode setting means continues to set the print mode to the demonstration print mode until the power is turned off.

[Claim 28] The printing apparatus as set forth in any one of claims 12 through 26, wherein, after setting the print mode to the demonstration print mode, the mode setting means continues to set the print mode to the demonstration print mode until one demonstration printing is finished.

[Detailed Description of the Invention]

[0001]

[Technical Field to Which This Invention Belongs]

This invention relates to a printing apparatus which performs printing based on print data sent from a host computer.

[0002]

[Prior Art]

There is conventionally known a printing apparatus (label writer) in which printing on a tape is performed based on print data or control data which is transmitted from a host computer, and the tape is cut to a predetermined length, thus creating a label (see, e.g., Patent Document 1). This kind of printing apparatus is not equipped, on a printing apparatus case thereof, with a user interface for creating and editing data. Therefore, when conducting shipping inspections of products or performing demonstration printing in sales activities, printing has to be carried out by installing a printing apparatus driver and a print-only application in the host computer, thereafter connecting the host computer and the printing apparatus together using a cable or the like, and then transmitting the print data from the host computer to the printing apparatus.

[0003]

[Patent Document] Published Unexamined Japanese Patent Application No. 2002-036397, Pages 3-4, FIG. 1).

[0004]

In other words, when performing demonstration printing, it is required to prepare a display, a keyboard, a cable and the like, in addition to the host computer in which the printing apparatus driver and the like are installed. Therefore, preparation thereof requires time. In addition, in sales promotion activities, it has been very inconvenient in that the host computer had to be carried around, or that a request must be made of the customer to prepare a host computer which has mounted thereon an OS (operation system) which corresponds to the printing apparatus.

[0005]

[Problems That the Invention is to Solve]

In view of the above-described problems, this invention has an object to provide a printing apparatus which is capable of performing demonstration printing easily without being connected to a host computer.

[0006]

[Means to Solve the Problems]

According to this invention, there is provided a printing apparatus which performs printing based on print data sent from a host computer and in which a user interface to be operated by a user is eliminated, comprising: a connection interface which connects the printing apparatus to a peripheral device including the host computer; connection object detection means for detecting a connection object of the connection interface; mode setting means for setting a print mode, depending on the detected connection object, to either a normal print mode in which printing is performed based on the print data sent from the host computer, or a demonstration print mode in which printing is performed based on demonstration print data which is stored in advance; and demonstration printing means for performing demonstration printing on a print medium

with a specific operation by the user serving as a trigger therefor when the print mode is set to the demonstration print mode, wherein the mode setting means sets the print mode to the normal print mode when the connection object is the host computer and to the demonstration print mode when the connection object is not the host computer or when there exists no connection object.

[0007]

According to this arrangement, when the connection object is not the host computer or there is no connection object, the print mode is set to the demonstration print mode and printing is performed based on the demonstration print data which is stored in the printing apparatus in advance. Thus, the printing apparatus can perform demonstration printing easily without being connected to the host computer. In addition, the printing apparatus does not include a user interface to be operated by the user and performs the demonstration printing utilizing a specific operation by the user as a trigger for printing. Therefore, by sharing the specific operation with another operation (for example, an operation of supplying power), the user does not need to carry out a special operation (for example, depression of a print execution key) in order to execute printing and thus the demonstration printing can be performed more easily. Further, since the printing apparatus can be constructed without the user interface, cost reduction can be realized. The user interface includes a key, dual inline package switch, button and touch panel for executing functions to carry out printing, creating and editing print data.

[0008]

Preferably, the connection object detection means detects the connection object when power is supplied.

[0009]

According to this arrangement, the connection object can be detected and the print mode can be set to

the demonstration print mode, based on an operation of supplying power which is inevitable for the user to allow the printing apparatus to execute printing. Namely, no special operation is required for mode setting, thus saving the user the trouble of carrying out the special operation.

[0010]

In this case, preferably, the connection object detection means detects the connection object when the print medium is mounted.

[0011]

According to this arrangement, the connection object can be detected and the print mode can be set to the demonstration print mode, based on an operation of mounting the print medium which is inevitable for the user to allow the printing apparatus to execute printing. Namely, no special operation is required for mode setting, thus saving the user the trouble of carrying out the special operation.

[0012]

In this case, preferably, the connection object detection means detects the connection object when the connection object is connected.

[0013]

According to this arrangement, the connection object can be detected and the print mode can be set to the demonstration print mode, based on an operation of connecting the connection object which is considered necessary for the user to allow the printing apparatus to execute printing. Namely, no special operation is required for mode setting, thus saving the user the trouble of carrying out the special operation.

[0014]

In this case, preferably, the mode setting means sets the print mode to the demonstration print mode when the connection object is an attachment exclusively used for demonstration printing.

[0015]

According to this arrangement, the print mode is

set to the normal print mode when the connection object is the host computer and to the demonstration print mode when the connection object is the attachment exclusively used for demonstration printing. This simple construction thus enables the mode setting means to perform a process of detecting the connection object (process of setting the print mode) to be easily and surely performed.

[0016]

In these cases, preferably, the specific operation includes an operation of supplying power.

[0017]

According to this arrangement, demonstration printing can be performed based on the operation of supplying power which is inevitable for the user to allow the printing apparatus to perform printing. Namely, no special operation is required for executing the demonstration printing, thus saving the user the trouble of carrying out the special operation.

[0018]

In these cases, preferably, the specific operation includes an operation of mounting the print medium.

[0019]

According to this arrangement, the demonstration printing can be performed based on the operation of mounting the print medium which is inevitable for the user to allow the printing apparatus to perform printing. Namely, no special operation is required for executing the demonstration printing, thus saving the user the trouble of carrying out the special operation.

[0020]

In these cases, preferably, the specific operation includes an operation of connecting the connection object.

[0021]

According to this arrangement, demonstration printing can be performed based on the operation of connecting the connection object which is considered necessary for the user to allow the printing apparatus

to perform printing. Namely, no special operation is required for executing demonstration printing, thus saving the user the trouble of carrying out the special operation.

[0022]

In this case, preferably, the print medium is a tape and the printing apparatus further comprises a tape cartridge mounting portion for mounting a tape cartridge having housed therein the tape in a state of being wound. The tape cartridge mounting portion has a lid member which is closed after the tape cartridge is mounted, and the connection object detection means detects the connection object when the lid member is closed.

[0023]

According to this arrangement, closure of the lid member is detected after mounting the tape cartridge where the tape is housed. Thus, in comparison with a case in which the mounting of the tape itself is detected, loading (mounting) of the print medium can be easily detected.

[0024]

In this case, preferably, the specific operation includes an operation of mounting the tape cartridge.

[0025]

According to this arrangement, the demonstration printing can be performed based on the operation of mounting the tape cartridge which is inevitable for the user to allow the printing apparatus to perform printing. Namely, no special operation is required for executing the demonstration printing, thus saving the user the trouble of carrying out the special operation.

[0026]

in these cases, preferably, the print medium is a discoid write-once optical disk.

[0027]

According to this arrangement, the printing apparatus which performs printing on the discoid write-once optical disk medium, can perform demonstration

printing easily without being connected to the host computer. The discoid write-once optical disk is defined as a CD-R, CD-RW, DVD-R, DVD-RW, DVD-RAM, and the like.

[0028]

According to another invention, there is provided a printing apparatus which performs printing based on print data sent form a host computer, comprising: print medium detection means for detecting a kind of a print medium mounted on the printing apparatus; mode setting means for setting a print mode to either a normal print mode in which printing is performed based on the print data received from the host computer, depending on the detected kind of the print medium, or a demonstration print mode in which printing is performed based on demonstration print data which is stored in advance; and demonstration printing means for performing demonstration printing on the print medium with a specific operation by a user serving as a trigger therefor when the print mode is set to the demonstration print mode.

[0029]

According to this arrangement, the kind of print medium is detected, and the print mode is set to either the normal print mode or the demonstration print mode depending on the kind of print medium. When the print mode is set to the demonstration print mode, printing is performed based on the demonstration print data which is stored in the printing apparatus in advance. Thus, the printing apparatus can perform demonstration printing easily without being connected to the host computer.

[0030]

In this case, preferably, the print medium detection means detects the print medium when power is supplied.

[0031]

According to this arrangement, the print medium can be detected and the print mode can be set based on

an operation of supplying power which is inevitable for the user to allow the printing apparatus to execute printing. Namely, no special operation is required for mode setting, thus saving the user the trouble of carrying out the special operation.

[0032]

In this case, preferably, the print medium detection means detects the print medium when the print medium is mounted.

[0033]

According to this arrangement, the print medium can be detected and the print mode can be set based on an operation of mounting the print medium which is inevitable for the user to allow the printing apparatus to execute printing. Namely, no special operation is required for mode setting, thus saving the user the trouble of carrying out the special operation.

[0034]

In these cases, preferably, a user interface to be operated by the user is eliminated.

[0035]

According to this construction, the user interface (for example, a print execution key) to be operated by the user is eliminated, thus reducing the cost for providing the user interface on the printing apparatus case.

[0036]

In these cases, preferably, the printing apparatus further comprises a print execution key by which the user instructs an execution of printing, and the print medium detection means detects the print medium when the print execution key is depressed by the user.

[0037]

According to this arrangement, the print medium is detected and the print mode is set when the print execution key is depressed by the user. Thus, there is no possibility that the user set the print mode erroneously by an operation which the user does not intend to execute (for example, the operation of

supplying power).

[0038]

In this case, preferably, the specific operation includes an operation of depressing the print execution key.

[0039]

According to this arrangement, the demonstration printing is executed by depressing the print execution key serving as a trigger for detecting the print medium and setting the print mode. Thus the user can perform the processes by depressing the key once.

[0040]

In these cases, preferably, the specific operation includes an operation of supplying power.

[0041]

According to this arrangement, the demonstration printing can be performed based on the operation for supplying power which is inevitable for the user to allow the printing apparatus to execute printing. In other words, since no special operation is required for the demonstration printing, the user can save the trouble of carrying out the special operation.

[0042]

In these cases, preferably, the specific operation includes an operation of mounting the print medium.

[0043]

According to this arrangement, demonstration printing can be performed based on the operation for mounting the print medium which is inevitable for the user to allow the printing apparatus to execute printing. In other words, since no special operation is required for the demonstration printing, the user can save the trouble of carrying out the special operation.

[0044]

In this case, preferably, the print medium is a tape and the printing apparatus further comprises: a tape cartridge mounting portion for mounting a tape cartridge having housed therein the tape in a state of

being wound. The tape cartridge mounting portion has a lid member which is closed after the tape cartridge is mounted, and the print medium detection means detects the kind of the tape cartridge when the lid member is closed.

[0045]

According to this arrangement, the kind of the tape cartridge having housed therein the tape is detected. Thus, the kind of the print medium can be easily detected in comparison with a case in which the kind of the tape itself is detected. Further, since mounting of the tape cartridge is detected by closure of the lid member, the mounting of the tape cartridge can be surely detected in comparison with a case in which mounting of the tape itself is detected.

[0046]

Preferably, the specific operation includes an operation of closing the lid member.

[0047]

According to this arrangement, demonstration printing can be performed based on an operation of closing the lid member which is inevitable for the user to allow the printing apparatus to execute printing apparatus. In other words, since no special operation is required for executing the demonstration printing, the user can save the trouble of carrying out the special operation.

[0048]

In this case, preferably, the print medium is a discoid write-once optical disk.

[0049]

According to this arrangement, in the printing apparatus which performs printing on the discoid write-once optical disk, the demonstration printing can be easily performed without being connected to the host computer.

[0050]

In these cases, the above-described printing apparatus preferably further comprises a connection

interface which connects the printing apparatus to a peripheral device including the host computer, and connection object detection means for detecting a connection object of the connection interface. When the connection object is the host computer, the mode setting means sets the print mode to the normal print mode irrespective of the mounted print medium.

[0051]

According to this arrangement, when the connection object is the host computer, the print mode is set to the normal print mode irrespective of the mounted print medium. Therefore, the demonstration printing is not executed against the user's intention even if the user unintentionally mounts the print medium which is not exclusively used for the normal print mode (or even if the print medium dedicated to demonstration printing is mounted).

[0052]

In this case, preferably, when the connection object detected by the connection object detection means is an attachment exclusively used for demonstration printing, the mode setting means sets the print mode to the demonstration print mode irrespective of the mounted print medium.

[0053]

According to this arrangement, when the connection object is an attachment exclusively used for demonstration printing, the print mode is set to the demonstration print mode irrespective of the mounted print medium. Therefore, the demonstration printing can be executed even if the user unintentionally mounts the print medium which is not exclusively used for the demonstration print mode (or even if the print medium exclusively used for normal printing is mounted).

[0054]

In these cases, preferably, when the print medium detected by the print medium detection means is a specific print medium, the mode setting means sets the print mode to the demonstration print mode irrespective

of the connection object detected by the connection object detection means.

[0055]

According to this arrangement, when the detected print medium is a specific print medium, the print mode is set to the demonstration print mode irrespective of the connection object. Therefore, demonstration printing can be executed even if the user unintentionally connects the printing apparatus to the host computer.

[0056]

In these cases, preferably, the specific operation includes an operation of connecting the connection object.

[0057]

According to this arrangement, demonstration printing can be performed based on that operation of connecting the connection object which is considered necessary for the user to allow the printing apparatus to execute printing. Namely, since no special operation is required for executing the demonstration printing, the user can save the trouble of executing the special operation.

[0058]

In these cases, preferably, after setting the print mode to the demonstration print mode, the mode setting means keeps to the demonstration print mode until the power is turned off.

[0059]

According to this arrangement, after the print mode is set to the demonstration print mode, the demonstration print mode continues until the power is turned off. Therefore, the demonstration printing can be executed as many times as required unless power is turned off. This is effective, for example, at the time of consecutively performing demonstration printing for customers during sales activities.

[0060]

In these cases, preferably, after setting the

print mode to the demonstration print mode, the mode setting means continues to set the print mode to the demonstration print mode until one demonstration printing is finished.

[0061]

According to this arrangement, after the print mode is set to the demonstration print mode, the demonstration mode is continued until one demonstration printing is finished. Therefore, it is advantageous when demonstration printing is desired to be performed only once.

[0062]

[Mode for Carrying the Invention into Effect]

Hereinbelow, a description will now be made about a printing apparatus in one embodiment of this invention with reference to the accompanied drawings. This invention is a printing apparatus which is provided with a normal print mode in which printing is performed based on print data received from the host computer, and a demonstration print mode in which printing is performed based on demonstration print data (i.e., print data for use in demonstration printing in conducting a shipment inspection of a product and a sales activity). The printing apparatus sets a mode, depending on a print medium or a connection object, and when the mode is set to the demonstration print mode, the printing apparatus also performs printing based on the demonstration print data which is stored in the printing apparatus in advance. Therefore, demonstration printing can be easily performed without connection to the host computer.

[0063]

Further, in this printing apparatus, a user interface which is operated by a user is eliminated and demonstration printing is performed by causing a specific operation to serve as a trigger. Therefore, by causing the specific operation to serve a dual function of another operation for executing printing (for example, an operation of supplying power), the

user need not carry out a special operation for executing printing (for example, depressing the print execution key), whereby demonstration printing can be performed more easily. Description will therefore be made hereinbelow about an example of a label writer which prints onto a tape-shaped print medium and cuts the print medium into a predetermined length to thereby create a label.

[0064]

FIG. 1 is an external perspective view of a label writer 1 in this embodiment, in which a tape cartridge C is mounted on the tape writer 1 and in which an opening/closing lid (lid member) is closed. FIG. 2 is an external perspective view of the label writer 1 in which the tape cartridge C is detached and in which the opening/closing lid is left open. As shown in both of the drawings, the label writer 1 of this invention is connected to a host computer 30 through a cable 42 and a USB connecter 41, and includes an opening/closing lid 21 which is opened/closed when mounting/dismounting the tape cartridge C, a pocket (tape cartridge mounting portion) 6 in which the tape cartridge is mounted, a tape ejection opening 22 which delivers a tape T (print medium) reeled out from the tape cartridge C, a tape cutter 131 which cuts the printed tape T, and connection interface 25 (USB interface) (see FIG. 3) which receives print data and control data from the host computer 30. Further, as shown in the drawings, in the label writer 1 of this invention, there is eliminated a user interface such as a key, a DIP switch, a button and a touch panel which are for executing functions to execute printing, to create and edit print data, thereby achieving a small and cost-saving construction.

[0065]

In pocket 6, there are formed: a head unit 61 made of a print head (thermal head) 7 and the like; a tape cartridge kind detection sensor 142 (see FIG. 3) made of a plurality of micro-switches 64 for recognizing the

kind of the tape cartridge C (kind of the tape T); and drive axes 62, 63 which are engaged with driven portions of the mounted tape cartridge C. The tape T and an ink ribbon R within the tape cartridge C are fed by these drive axes 62 and 63, and the print head 7 is driven synchronously with the tape T and the ink ribbon R, thereby performing printing.

[0066]

Furthermore, in the tape cartridge C, the tape T and the ink ribbon R with a given width (about 3.5 mm to 48 mm) are housed inside a cartridge case 51 in a state of being wound, respectively, and a through opening 55 is formed to insert a head unit 61 disposed in the pocket 6 therethrough. In addition, a plurality of small holes (not shown) are provided on the back surface of the tape cartridge C in order to identify the kind of the tape cartridge C (recognition of the width and material of the tape T or the like is also acceptable) by the plurality of microswitches 64. In this embodiment, setting is made to either a normal print mode in which printing is performed based on the print data received from the host computer 30 depending on a detection result by these microswitches 64, or a demonstration print mode in which printing is performed based on the demonstration print data which is stored in advance. Details thereof will be described later.

[0067]

The tape T has a construction in which an image-receiving layer (print surface) Ta, an adhesive layer Tb and a release paper layer Tc are laminated. A created label is used by removing the release paper layer Tc and sticking the adhesive layer Tb onto an object for sticking. The tape T and the ink ribbon R move while overlapping each other at the position of the through opening 55, and only the tape T is discharged outside whereas the ink ribbon R is wound within the tape cartridge C.

[0068]

On the other hand, the host computer 30 includes a

main body device 32 and peripherals such as a display 33, a keyboard 34, a mouse 35 and the like which are connected to the main body device 32. As a result of the operation by the user of the keyboard 34, the mouse 35 and the like, the print data and control data are created and sent to the label writer 1 through a PC interface 31.

[0069]

Here, a description will now be made about the control configuration of the label writer 1 with reference to a control block diagram in FIG. 3. The label writer 1 is constituted by: a data input/output unit 11 which has the connection interface 25, and which inputs the print data and control data transmitted from the host computer 30 through the PC interface 31 and which also outputs data on processing situation or the like within the label writer 1 to the host computer 30; a printing unit 12 which has a pocket 6 with cartridge C and a print head 7 arranged inside, and a tape feed unit 120 for conveying the tape T and the ink ribbon R by means of a feed motor 121, and which performs printing on the tape T based on the print data transmitted from the host computer 30; a cutting unit 13 which has a tape cutter 131 and a cutter motor 132 for driving the tape cutter 131, and which cuts the printed tape T to have a predetermined length; a detection unit 14 which has a rotation speed sensor 141 for detecting a rotation speed of the feed motor 121, a tape cartridge kind detection sensor 142 for detecting the kind of the tape cartridge C, an ambient temperature sensor 143 for detecting an ambient temperature (environment temperature), and a head-surface-temperature detection sensor 144 for detecting the surface temperature of the print head 7, and which performs various detection; a drive unit 270 which has a head driver 272 and a motor driver 273 (feed motor driver 273d and a cutter motor driver 273c), and which drives corresponding sections, respectively; and a control unit 200 which is connected to each of the

units, and which controls the entire label writer 1.

[0070]

The control unit 200 has a CPU 210, a ROM 220, a character generator ROM (CG-ROM) 230, a RAM 240 and an input output controller (hereinafter, referred to as IOC) 250, and they are connected to each other through an internal bus 260. The ROM 220 has: a control program block 221 which stores a control program to be processed in the CPU 210; and a control data block 222 which stores therein data relating to setting conditions (such as the kind of tape cartridge C) for print mode setting, and control data inclusive of demonstration print data for use in performing demonstration printing. Further, font data such as special fonts and logotypes (picture writings) can be stored in the CG-ROM 230. When these special fonts and logotypes are stored in the CG-ROM 230, if the code data which specifies a font or logotype is given, corresponding font data is outputted. The control unit may be arranged without this CG-ROM 230.

[0071]

The RAM 240 is used as work area for control processing and has various work area blocks 241 used as flags and the like, a print data block 242 which stores print data transmitted from the host computer 30, and a print mode block 243 which stores the print mode which is set depending on the kind of the tape cartridge C. In addition, the Ram 240 is always backed up so that data stored therein can be retained even if the power is turned off.

[0072]

A logic circuit, which compensates for functions of the CPU 210 and which is used to handle interface signals with various periphery circuits, is constituted by a gate array, custom LSI and the like and is assembled into the IOC 250. Thus, the IOC 250 fetches the print data and the control data from the host computer 30 as they are or after processing them, into the internal bus 260. Also, by interlocking with the

CPU 210, the IOC 250 outputs data and control signals, which have been outputted from the CPU 210 to the internal bus 260, to the drive unit 270 as they are or after processing them.

[0073]

Thereafter, the CPU 210 inputs various signals and data from each of the units within the label writer 1 through the IOC 250 in accordance with the control program within the ROM 220, processes the font data from the CG-ROM 230 and various signals and data within the RAM 240, and then outputs various signals and data to each of the units within the label writer 1 through the IOC 250, whereby the setting of the print mode (normal print mode or demonstration print mode) and the controlling of the print processing in accordance with the print mode are performed.

[0074]

Here, a description will now be made about the method of print mode setting and the method of printing in the label writer 1 with reference to a flow chart in FIG. 4. As described hereinabove, the label writer 1 of this invention is provided with two modes in the form of the normal print mode in which printing is performed based on the print data received from the host computer 30, and the demonstration print mode in which printing is performed based on the printing data for demonstration so that the mode setting can be made depending on the print medium and the connection object.

[0075]

Then, a description will now be made about an example in which the print mode is set depending on the print medium (see FIG. 5(a)) and in which the mode setting condition is "set the print mode to the demonstration print mode when the tape cartridge is of a specific kind" (condition T-1). In addition, although various forms are considered with respect to an operation serving as a chance (trigger) for detection of the print medium and mode setting, an operation serving as a chance (trigger) for starting

printing, and setting at the time of ending the demonstration print mode, it is assumed here that the operation serving as a trigger for detection of the print medium, mode setting, and starting demonstration printing is the supply of power (power connection) by the user, and that the setting at the time of ending the demonstration printing is until one demonstration printing is performed (see FIG. 6: STEP 1=A, STEP 2=A and STEP 3=B). In this example (STEP 1=A, STEP 2=A and STEP 3=B), it is required to mount the print medium (here, the tape cartridge C) before power is supplied (the preconditions in other examples will be described hereinafter).

[0076]

As shown in FIG. 4, once power for the label writer 1 is connected (ON) (S11) by the user, the micro-switches 64 detect the kind of tape cartridge C (S12). If the tape cartridge C is identified as the one for demonstration printing (S13: Yes), the print mode is set to the demonstration print mode (S14), and then demonstration printing is performed (S15). After demonstration printing is performed once, demonstration printing ends and power is automatically turned off (OFF) (S16), and the label writer 1 waits for the next connection to power supply. On the other hand, if the tape cartridge C is identified as being not the one for demonstration printing (S13: No), the print mode is set to the normal print mode (S17), and the label writer 1 waits to receive the print data from the host computer 30. At this time, when print data has been received from the host computer 30 (S18: Yes), normal printing is performed (S19) based on the print data, and normal printing is performed each time the print data is received until the power is turned off (OFF) by the user (S18 - S20).

[0077]

By the way, in this embodiment, the reason why the mounting of the print medium (tape cartridge C) is made to be a prerequisite of the power supply, is that the

print mode is set depending on the kind of the tape cartridge C which is detected at the time of power supply.

[0078]

As described so far, according to this invention, the kind of the tape cartridge C (print medium) is detected, and either the normal print mode or the demonstration print mode is set depending on the kind of the tape cartridge C. When setting is made to the demonstration print mode, printing is performed based on the demonstration print data which is stored in the ROM 220 or the like of the label writer 1 in advance. Therefore, demonstration printing can be easily performed without connection to the host computer 30. In addition, detection of the kind of the tape cartridge C, setting of the print mode, and demonstration printing can be carried out based on that operation of supplying power which is inevitable for the user to cause the label writer 1 to execute printing. In other words, since special operations for mode setting and executing demonstration printing are not required, the user can save the time and trouble. Further, since the kind of the tape cartridge C in which the tape T is housed is detected, the kind of the print medium can be easily detected as compared with the case in which the kind of the tape T itself is detected.

[0079]

In this embodiment, a description has so far been made of the case in which the mode setting condition is to "set the print mode to the demonstration print mode when the tape cartridge is of a specific kind" (see condition T-1 and S13 in FIG. 4). The mode setting condition may be "set the print mode to the normal print mode when the print medium (tape cartridge exclusively used for normal printing) is of specific kind" (condition T-2). In this case, data regarding the specific kind of tape cartridge C which sets the print mode to the normal print mode is stored in the

ROM 220 in advance, and setting is made to the normal print mode if this condition is met and, if this condition is not met, setting is made to the demonstration print mode.

[0080]

Further, in this example, an arrangement is made so as to detect the kind of the tape cartridge C. However, the kind of the tape T (print medium) itself may be detected to thereby set the print mode accordingly.

[0081]

Here, a description will now be made about other forms of operation serving as a trigger for detecting the print medium (tape cartridge C) and mode setting (STEP 1), the operation serving as a trigger for starting the demonstration printing (STEP 2), and the setting at the time of ending the demonstration print mode (STEP 3), in case where the mode setting is performed depending on the print medium as in this embodiment. As shown in FIG. 6, although multitudes of combinations of STEP 1 to STEP 3 can be made, in the case of the examples shown in this drawing, there do not exist the combinations of (STEP 1=A: time when power is supplied, STEP 2=B: time when the print medium is mounted), and (STEP 1=C: time when the connection object is connected, STEP 2=B: time when the print medium is mounted). Here, the time when the connection object is connected is defined to be the time when the connection object (the host computer 30 in the illustrated case) is connected to the connection interface 25 which is formed on a main body case 2 of the label writer 1.

[0082]

Further, in the case of "STEP 1=A: time when power is supplied", it is the prerequisite to mount the print medium before supplying power. In the case of "STEP 1=C: time when the connection object is connected", it is the prerequisite to mount the print medium before the connection object is connected.

[0083]

Still furthermore, in the case of "STEP 1=B and STEP 2=B: time when the print medium is mounted (the tape cartridge is mounted)", the mounting of the print medium is detected by the closing of the opening/closing lid 21 when the print medium is supplied by the tape cartridge C. Since mounting of the tape cartridge C is detected by closing of the opening/closing lid 21, the trigger therefor can be surely detected as compared with the case in which the mounting of the tape T itself is detected. By the way, when the lid is closed in a state in which the tape cartridge C remains mounted, it is determined that the tape cartridge C is mounted. When the lid 21 is closed while the tape cartridge C is not mounted, it is naturally not regarded as the mounting of the tape cartridge C.

[0084]

Furthermore, in the case of "STEP 2=B: time when the print medium is mounted", it is the precondition that the power supply is performed before the print medium is mounted. In the case of "STEP 2=C: time when the connection object is connected", it is the precondition that the power supply is performed before the connection object is connected. This is because, without supply of power, print processing cannot be executed despite the performance of the operation which triggers the start of printing.

[0085]

Moreover, in both of the cases of the example shown here, in the case of "STEP 3=A: until the power is turned off" and "STEP 3=B: until one demonstration printing finishes", the electric power must be plugged in or out in the case of STEP 1=A or STEP 2=A, when the demonstration printing is repeated. Similarly, in order to repeat demonstration printing, in the case of STEP 1=B or STEP 2=B, the print medium must be inserted and removed (the tape cartridge C must be mounted and dismounted). In the case of STEP 1=C or STEP 2=C, the

connection object (connector) must be connected and disconnected.

[0086]

By the way, the ending of the demonstration print mode (STEP 3) is not limited to these conditions, but may be set as "until predetermined times of demonstration printing finishes." In this case, the predetermined number of times of demonstration printing may be performed consecutively or performed each time of operation to start the printing. Namely, in the latter case, in the case of combination, e.g., of "STEP 1=A: time when power is supplied, STEP 2=B: time when the print medium is mounted", the demonstration printing is repeated by the insertion and removing of the print medium. The demonstration print mode will be reset when the operation has reached a predetermined number of times and upon finishing of the demonstration printing.

[0087]

As described hereinabove, in the case of setting the print mode depending on the print medium, various combinations shown in FIG. 6 become possible as the operation serving as a trigger for detection of the print medium (tape cartridge C) and mode setting (STEP 1), the operation serving as a trigger for starting the demonstration printing (STEP 2), and the setting of time when the demonstration printing ends (STEP 3).

[0088]

Next, a description will be made, with reference to FIG. 5, about a case in which the print mode setting is made under conditions other than the print medium (tape cartridge C). As shown in the drawing, the mode setting condition includes not only the condition depending on the print medium (see FIG. 5(a)), but a condition depending on the connection object (see FIG. 5(b)), and a condition depending on the connection object and the print medium (see FIG. 5(c)). The description begins with the case of setting the print mode depending on the connection object.

[0089]

Here, the condition depending on the connection object is defined as a condition depending on the kind of object (host computer 30 in this case) to which is connected the connection interface 25 (see FIG. 1) which is formed in the main body case of the label writer 1. The kind of connection object is detected by comparing a stored signal level and a signal level detected by connection of the connection interface 25.

[0090]

Now, a description will be made about the three examples shown in FIG. 5(b). When, for example, the mode setting condition is "to set the print mode to the demonstration print mode when the connection object is not the host computer or when there is no connection object" (condition C-1), setting is made to the normal print mode only when the connection object is detected as the host computer 30. Namely, this condition (condition C-1) corresponds to a condition "to set the print mode to the normal print mode when the connection object is the host computer" (condition C-3).

[0091]

Alternatively, when the mode setting condition is "to set the print mode to the demonstration print mode when the connection object is an attachment exclusively used for demonstration printing" (condition C-2), setting is made to the normal print mode when the connection object other than the attachment exclusively used for the demonstration printing is detected. Here, with reference to FIG. 9, a description will be made about a circuit configuration of the attachment 50 exclusively used for demonstration printing (hereinafter, referred to as an "exclusive attachment"). As shown in the drawing, when the exclusive attachment 50 is connected to the connection interface 25 (USB connector 41), signal levels of Signal 1 and Signal 2 outputted from ports of the exclusive attachment 50 are detected, and the connection object is detected as the exclusive attachment 50. Therefore, in the case of the

condition C-2, the print mode is set to the normal print mode when the signal levels of Signal 1 and Signal 2 are different from predetermined signal levels stored (signal levels detected by the exclusive attachment).

[0092]

By the way, the dedicated attachment may be replaced by a commercially available USB hub (self powered hub) or the like. According to this arrangement, it is possible to realize a configuration for setting the print mode to the demonstration print mode at a low cost.

[0093]

Here, a description will now be made, in the case of setting mode depending on the connection object, about several modes of the operation serving as a trigger for detection of the connection object and mode setting (STEP 1), the operation serving as a trigger for starting the demonstration printing (STEP 2), and setting of time when the demonstration printing ends (STEP 3). As shown in FIG. 7, multitudes of combinations of STEP 1 to STEP 3 can be made. However, in the case of the examples shown in the drawing, there do not exist the combinations of (STEP 1=A: when power is supplied, and STEP 2=C: when the connection object is connected), and (STEP 1=B: when the print medium is mounted, and STEP 2=C: when the connection object is connected).

[0094]

In addition, in the case of "STEP 1=A: time when power is supplied", it is a prerequisite to connect the connection object before power is supplied. In the case of "STEP 1=B: time when print medium is mounted" it is a prerequisite to connect the connection object before the print medium is mounted. Further, in the case of "STEP 2=A, time when power is supplied" it is a prerequisite to mount the print medium before power supply when STEP 1□B.

[0095]

Moreover, in the case of "STEP 2=B: time when the print medium is mounted", it is a prerequisite to supply power before print medium is mounted when STEP 1□A. In the case of "STEP 2=C: time when the connection object is connected" it is a prerequisite to connect the connection object and to supply power before print medium is mounted before connecting the connection object. This is because without supply of power and mounting of the print medium, print processing cannot be executed even when the operation which triggers start of printing is carried out.

[0096]

In addition, in the same manner as the foregoing case in which the print mode is set depending on the print medium (see FIG. 6), in the case of "STEP 3=A: time when power is turned off" or "STEP 3=B: until one demonstration printing finishes", the plugging in and out of the power is required in the case of STEP 1=A or STEP 2=A, and mounting and dismounting of the print medium (mounting and dismounting of the tape cartridge C) is required in the case of STEP 1=B or STEP 2=B. In the case of STEP 1=C or STEP 2=C, the plugging in and out of the connection object (connector) is required.

[0097]

Subsequently, a description will be made about the case in which the print mode is set depending on the connection object and the print medium (see FIG. 5(c)). In this case, when a specific condition is satisfied, the condition of any one of the connection object and the print medium is ignored. For example, when the mode setting condition is to "set the print mode to the normal print mode when the connection object is the host computer irrespective of the mounted print medium" (condition CT-1), the print mode is set to the normal print mode even when, for example, the mounted print medium is exclusively used for demonstration printing. According to this arrangement, even if the user unintentionally mounts the print medium not for exclusive use for the normal print mode, the

demonstration printing is not executed against the user's will.

[0098]

Further, when the mode setting condition is to "set the print mode to the demonstration print mode when the connection object is the attachment exclusively used for the demonstration printing irrespective of the mounted print medium" (condition CT-2), the print mode is set to the demonstration print mode even when, for example, the print medium for the normal print mode is mounted. According to this arrangement, demonstration printing can be performed even if the user unintentionally mounts the print medium not exclusively used for demonstration printing despite the fact that the user wants to carry out demonstration printing.

[0099]

In addition, when the mode setting condition is to "set the print mode to the demonstration print mode when the print medium is a specific print medium irrespective of the connection object" (condition CT-3), the print mode is set to the demonstration print mode even when, for example, the label writer is connected to the host computer 30. According to this arrangement, demonstration printing can be performed even if the user unintentionally connects the label writer 1 to the host computer 30 despite the fact that the user wants to carry out demonstration printing.

[0100]

Here, a description will be made about several forms of operation serving as a trigger for detection of the connection object and the print medium (tape cartridge C) (STEP 1), the operation serving as a trigger for starting demonstration printing (STEP 2), and setting of time when the demonstration printing ends (STEP 3), in the case of setting the print mode depending on the connection object and the print medium. As shown in FIG. 8, multitudes of combinations of STEP 1 to STEP 3 can be made. However, in the case of the

examples shown here, there does not exist the combination of (STEP 1=A: time when power is supplied, STEP 2=B: time when the print medium is mounted), (STEP 1=A: time when power is supplied, STEP 2=C: time when connection object is connected), (STEP 1=B: time when the print medium is mounted, STEP 2=C: time when the connection object is connected), and (STEP 1=C: time when connection object is connected, STEP 2=B: time when the print medium is mounted).

[0101]

Moreover, in the case of "STEP 1=A: time when power is supplied", it is a prerequisite to connect the connection object, and to mount the print medium before supplying power. In the case of "STEP 1=B: time when the print medium is mounted", it is a prerequisite to connect the connection object before mounting the print medium. Further, in the case of "STEP 1=C: time when the connection object is connected", it is a prerequisite to mount the print medium before connecting the connection object.

[0102]

Further, in the case of "STEP 2=B: time when the print medium is mounted", it is a prerequisite to supply power before mounting the print medium. In the case of "STEP 2=C: time when the connection object is connected", it is the prerequisite to supply power before connecting the connection object. In addition, in a manner similar to the foregoing case in which the print mode is set depending on the print medium or the connection object (see FIGS. 6 and 7), in either of the case of "STEP 3=A: time when power is turned off" and of the case of "STEP 3=B: until one demonstration printing finishes" the plugging in and out of the power source are required in order to repeat the demonstration printing in the case of STEP 1=A or STEP 2=A. In the case of STEP 1=B or STEP 2=B, it is required to mount and dismount the print medium (mounting and dismounting of the tape cartridge C). In the case of STEP 1=C or STEP 2=C, it is required to

plug in and out the connection object (connector).

[0103]

As set forth hereinabove, the label writer 1 of this invention is provided with two modes which are the normal print mode for performing printing based on the print data received from the host computer 30, and the demonstration print mode for performing printing based on the demonstration print data. In this label printing apparatus, the mode setting is performed depending on the print medium and the connection object. In addition, when the print mode is set to the demonstration print mode, printing is performed based on the demonstration print data which is stored in the label writer in advance. Therefore, the label writer 1 can perform the demonstration printing easily without being connected to the host computer 30.

[0104]

Moreover, the user interface to be used by the user is eliminated, and a specific operation by the user is used as a trigger to execute the demonstration printing. Therefore, the specific operation serving as a trigger in the detection of the print medium and the connection object, and the operation serving as a trigger for executing demonstration printing can be used in common with the operation are used in common with the operation (e.g., the operation to supply power) to perform printing. The user need not carry out a special operation for mode setting and executing printing (e.g., depression of a print execution key) and thus demonstration printing can be performed more easily. Furthermore, since the label writer can be constructed without the user interface, cost reduction can be achieved.

[0105]

Next, a description will now be made about a second embodiment with reference to FIGS. 10 to 12. In the above-mentioned first embodiment, the label writer 1 in which the user interface has been omitted is described as an example. In this embodiment, a CD-R

printer 301 having a print execution key 310 as a user interface is described as an example. The CD-R printer 301 is a device for printing onto the CD-R (print medium) characters and images such as a title of the CD, created in the host computer 30.

[0106]

FIG. 10 is an external perspective view of the CD-R printer 301 of this embodiment in a state in which the CD-R 320 is set therein. FIG. 11 is an external perspective view of the CD-R 320, a ribbon cartridge 351 to be mounted thereon, and the CD-R 320. As shown in both drawings, the CD-R printer 301 is completely covered with a cover case 303 which is made up of a front case 304 and rear case 305. In the front case 304, provided are a front cover 306 which is opened frontward as seen in the drawing, an opening/closing lid 307 which is opened and closed in a clicked manner, and a connection interface 325 (USB interface) which is connected to the host computer 30 through a cable and a USB connector. In addition, on the top surface of the CD-R printer 301, there are provided, on the boundary between the front case 304 and the rear case 305, an insertion slot 341 for inserting the CD-R 320 into the apparatus body, and a print execution key 310 for executing the demonstration printing. By depressing the print execution key 310, the detection of mounting of the CD-R 320 (print medium), setting of the print mode, and the demonstration printing are performed. The details thereof will be described later.

[0107]

Provided inside the printing apparatus are a head unit 321 having a print head 331 (thermal head), a ribbon cartridge 351 facing the print head 331, and a carriage 361 which mounts the print head 331 and the ribbon cartridge 351 thereon, which can be seen when the front cover 306 is opened. As the carriage 361 is moved, printing is performed onto a predetermined print area Dp of the DC-R 302 set in the printing apparatus.

[0108]

In the CD-R 320, a circular clamp opening Da is formed at the center thereof. The front side of the CD-R 320 as seen in the drawing is the print surface and the back side thereof is the recording surface in which various data such as music data is written. In general, a name of a manufacturer or the product name is printed on the CD-R 320 in advance, and they define the right and left and up and down of the CD-R 320. Further, that lower area of the disc which stands clear of the names of the manufacturer and the product is set as the print area Dp.

[0109]

Here, a description will now be made about a method of setting the print mode and printing in the CD-R printer 301 with reference to a flow chart in FIG. 12. In a manner similar to the label writer 1 of the foregoing first embodiment, the CD-R printer 301 of this invention has two modes of a normal print mode for printing based on print data received from the host computer 30, and a demonstration print mode for printing based on the demonstration print data.

[0110]

Here, a description will now be made about an example in which the print mode is set depending on a connection object (see FIG. 5(b)) and in which the mode setting condition is to "set the print mode to the demonstration print mode when the connection object is not the host computer or when there is no connection object" (condition C-1). In a manner similar to the first embodiment, various forms are considered with respect to an operation serving as a chance (trigger) for detection of the connection object and mode setting, an operation serving as a chance (trigger) for starting printing, and setting of time when the demonstration printing ends. Here, once the print execution key 310 is depressed, detection of mounting the CD-R 320 (print medium), print mode setting, and the demonstration print processing are executed. As to the setting of time when the demonstration print mode ends is

explained using an example in which the demonstration print mode ends after one demonstration printing is performed. In the case of this embodiment, it is required to mount the CD-R 320 and to supply power before depressing the print execution key 310.

[0111]

As shown in FIG. 12, once the print execution key 310 is depressed by a user (S11), the connection object which is connected to the connection interface 25 is detected (S12). When it is determined that the connection object is the host computer 30 (S13: Yes), setting is made to the normal print mode (S16). On the other hand, when it is determined that the connection object is not the host computer 30 (S13: No), setting is made to the demonstration mode (S14), and performs demonstration printing (S15). Once one the demonstration printing ends, the demonstration printing is finished and waits for the next depression of the print execution key.

[0112]

In addition, as described above, when it is determined that the connection object is the host computer 30 (S13: Yes), setting is made to the normal print mode. Thereafter, when the print data is received from the host computer 30 (S17: Yes), normal printing is performed based on the print data (S18), and the normal printing is performed each time of receiving print data (S17 to 19) until power is turned off (OFF) by the user.

[0113]

By the way, in this embodiment, the reason why the precondition is made to be that the CD-R 320 be mounted before depressing the print execution key is that printing cannot be performed if the CD-R 320 (print medium) is not mounted when starting the printing.

[0114]

As described above, according to this invention, the print medium is detected and the mode setting is made once the user depresses the print execution key

310. Thus, the user does not set the print mode by an erroneous operation (for example, an operation of supplying power) which user does not intend to carry out. Therefore, erroneous operations by the user can be reduced. Further, since the detection of the connection object, mode setting and the demonstration printing are performed by depressing the print execution key 310, the user can carry out these processes easily by one depression of the key.

[0115]

By the way, also in this embodiment, the mode setting conditions shown in FIG. 5 can be applied. Similar forms can also be applied to the operation serving as a trigger for detection of the print medium and mode setting (STEP 1), the operation serving as a trigger for starting demonstration printing (STEP 2), and setting of time when the demonstration print mode ends (STEP 3), which are shown in FIGS. 6 to 8.

[0116]

Further, this invention can be applied not only to the CD-R printer 301, but to a device which performs printing on a discoid write-once optical disk such as a CD-RW, a DVD-R, a DVD-RAM and the like.

[0117]

As explained in the above-mentioned first and second embodiments, according to the printing apparatus (label writer 1 and CD-R writer 301) of this invention, the print mode is set depending on the print medium and the connection object. When the print mode is set to the demonstration printing (in the first embodiment), printing is performed based on the demonstration print data which is stored within the printing apparatus in advance. Therefore, the demonstration printing can be easily performed without connection to the host computer 30. In addition, even if the printing apparatus is not provided with a user interface which is to be operated by the user, demonstration printing can be performed by causing a specific operation to serve as a trigger. Therefore, by sharing the specific

operation with another operation for executing printing (for example, an operation of supplying power), the user need not carry out a special operation for executing printing (for example, depression of the print execution key), whereby demonstration printing can be performed more easily. Further, since the printing apparatus can have a construction in which the user interface is eliminated, a cost reduction can be achieved.

[0118]

With the construction having a print execution key 310 (in the second embodiment), a series of operations for executing demonstration printing (detection of the connection object, mode setting and executing demonstration printing) can be carried out by one depression of a key, thereby saving the user the time and trouble. In addition, since the user is required to intentionally operate the print execution key 310, the user will no longer set the print mode by an erroneous operation which the user does not intend to carry out (for example, the operation of supplying power). Thus, the mode setting can be certainly carried out.

[0119]

In the foregoing examples, the connection interface 25 is defined as the USB interface, but may be any kind of interface including a serial interface, an SCSI interface, Centronics interface, and the like.

[0120]

Further, in the above-mentioned example (the first embodiment), the demonstration print data is arranged to be stored in the ROM 220, but may be arranged to be stored in the RAM 240 so that the data can be re-written as necessary from the host computer 30 or the like. According to this arrangement, suitable demonstration printing can be carried out for each purchaser (store) during sales activities. In addition, the demonstration print data need not be only one kind, but plural kinds of the same may be stored. In this

case, plural kinds of the demonstration print data may be sequentially outputted for each print instruction, or may be randomly outputted. According to this arrangement, a variety of demonstration printing can be performed.

[0121]

Further, in the above-mentioned examples, the print mode is set immediately after the detection of the print medium, but may be set by different triggers, respectively. Namely, the printing apparatus may have a construction in which the print medium is detected when power is supplied, the print mode is set when the print medium is mounted, and thereafter, the demonstration printing is started when the connection object is connected. Note that, in this case, it is a precondition that these operations are performed in the above-mentioned order.

[0122]

Furthermore, the printing apparatus is not limited to the above-mentioned examples of the label writer and the CD-R printer, and, for example, the print system and the construction of the printing apparatus may be changed as appropriate without departing from the gist of this invention.

[0123]

[Effects of the Invention]

As described in the foregoing, there is an effect in that the printing apparatus of this invention can perform demonstration printing easily without connection to an external device such as the host computer.

[Brief Description of the Drawings]

[FIG. 1] is an external perspective view of a label writer with a lid closed according to one embodiment of this invention.

[FIG. 2] is an external perspective view of the label writer with the lid open, tape cartridge and tape according to one embodiment of this invention.

[FIG. 3] is a control block diagram of the label writer according to one embodiment of this invention.

[FIG. 4] is a flowchart showing a method of setting a print mode and a method of printing by the label writer according to one embodiment of this invention.

[FIG. 5] is a table showing mode setting conditions according to one embodiment of this invention.

[FIG. 6] is an explanatory view showing an operation mode when a print mode is set depending on a print medium.

[FIG. 7] is an explanatory view showing an operation mode when the print mode is set depending on a connection object.

[FIG. 8] is an explanatory view showing an operation mode when the print mode is set depending on the connection object and the print medium.

[FIG. 9] is a circuit configuration of an attachment exclusively used for demonstration printing according to one embodiment of this invention.

[FIG. 10] is an external perspective view of a CD-R writer with a print medium inserted thereto, according to a second embodiment of this invention.

[FIG. 11] is an external perspective view of the CD-R writer, a ribbon cartridge and a storage medium according to the second embodiment of this invention.

[FIG. 12] is a flow chart showing a method of setting a print mode and a method of printing of the CD-R writer according to the second embodiment of this invention.

[Explanation of Marks]

1 Label writer
6 Pocket
11 Data input/output unit
12 Printing unit
13 Cutting unit
14 Detection unit
21 Opening/closing lid

25 Connection interface
30 Host computer
142 Tape cartridge kind detection sensor
200 Control unit
210 CPU
220 ROM
230 CG-ROM
240 RAM
250 IOC
260 Internal bus
270 Drive unit
301 CD-R writer
310 Print execution key
320 CD-R
325 Connection interface
C Tape cartridge
R Ink ribbon
T Tape

[Name of Document] Abstract

[Abstract]

[Problems] It is an object to provide a printing apparatus which is capable of easily executing demonstration printing without connection to a host computer.

[Solving Means] A printing apparatus is provided with: a connection interface 25 for connection to a peripheral device such as a host computer 30; a connection object detection means for detecting the connection object of the connection interface; and a mode setting means for setting, depending on the detected connection object, to either a normal print mode in which printing is performed based on print data received from the host computer, or to a demonstration print mode in which printing is performed based on demonstration print data which is stored in advance. The print mode setting means sets to the normal print mode when the connection object is the host computer, and sets to the demonstration mode when the connection object is not the host computer or when there is no connection object.

[Selected Figure] FIG. 4

FIG. 1

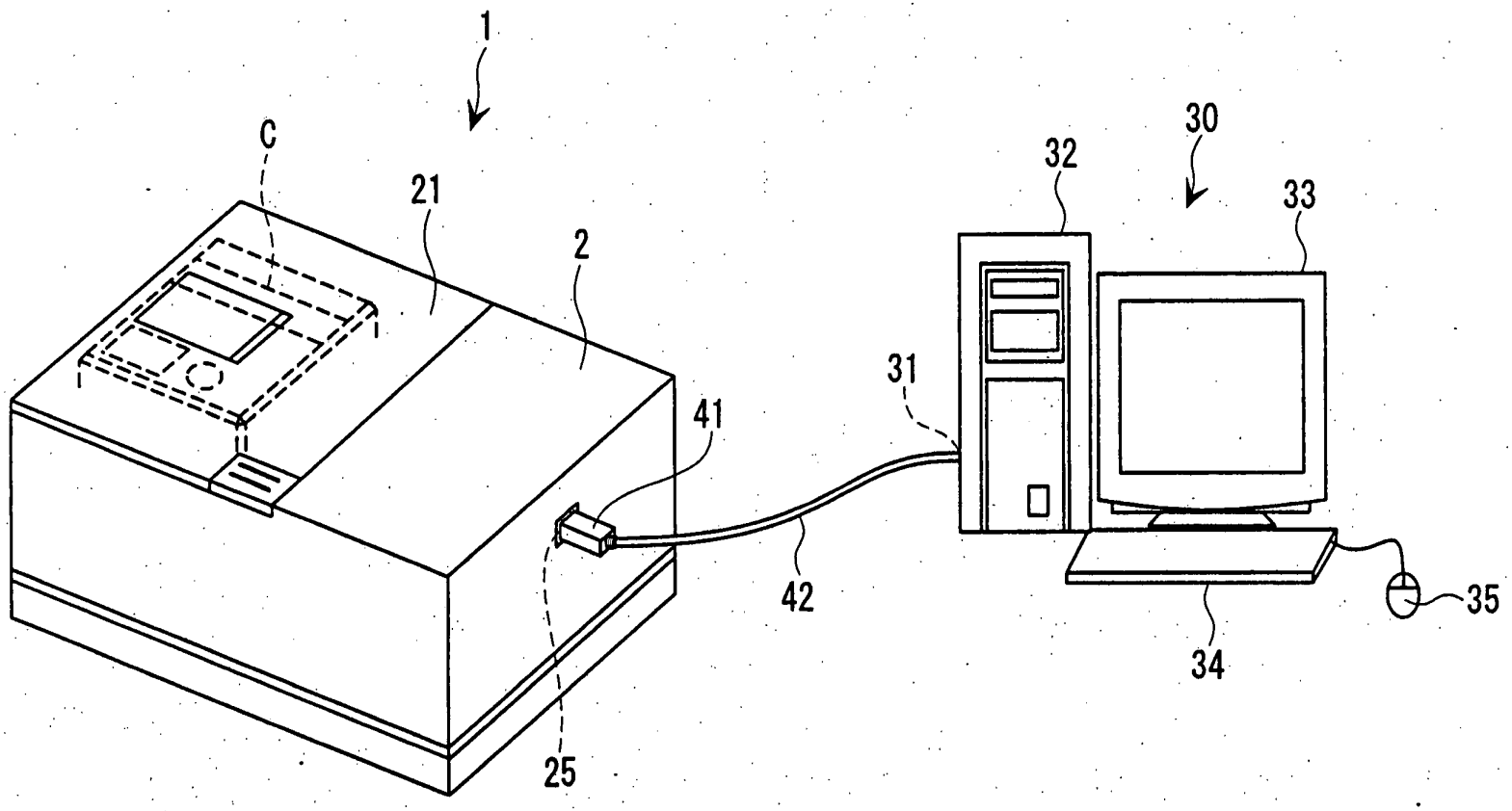


FIG. 2

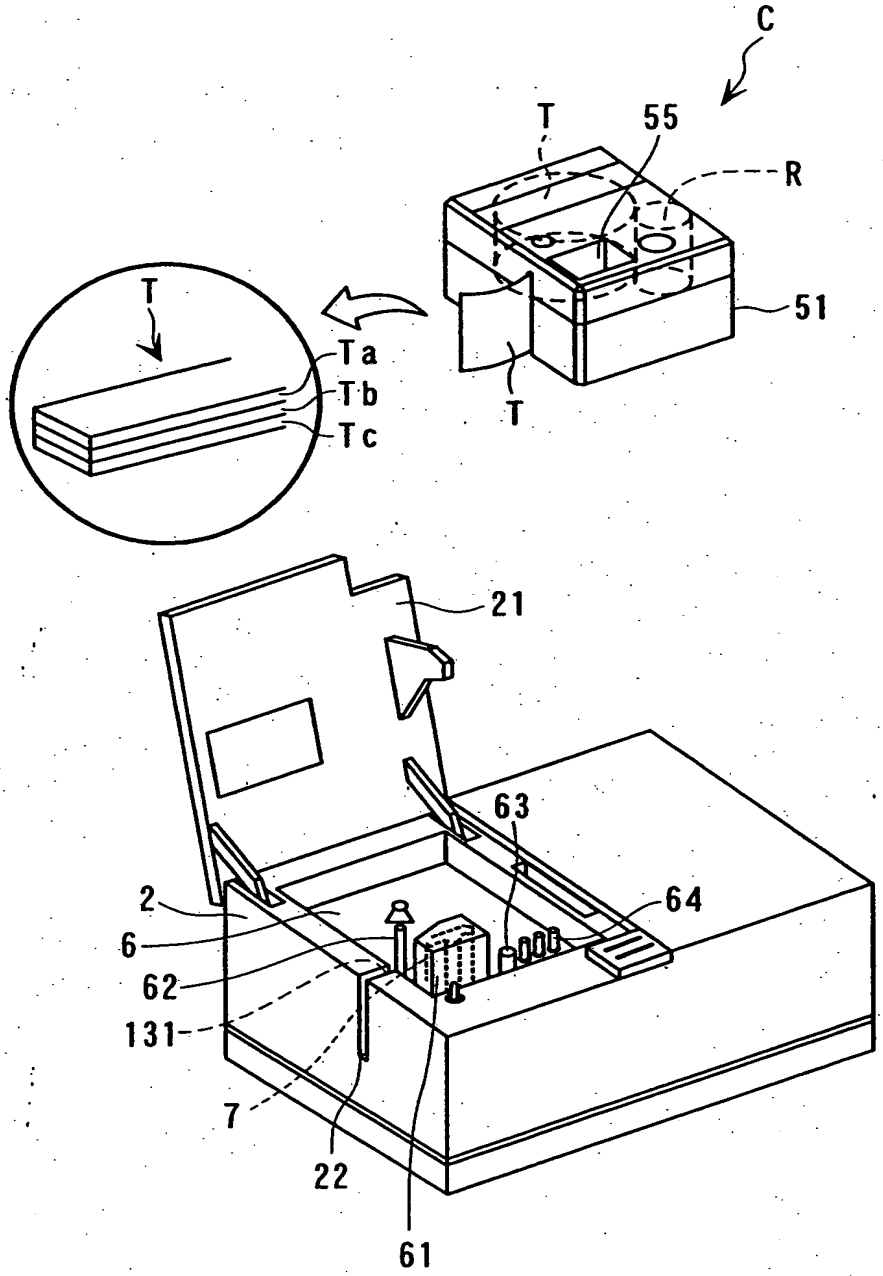


FIG. 3

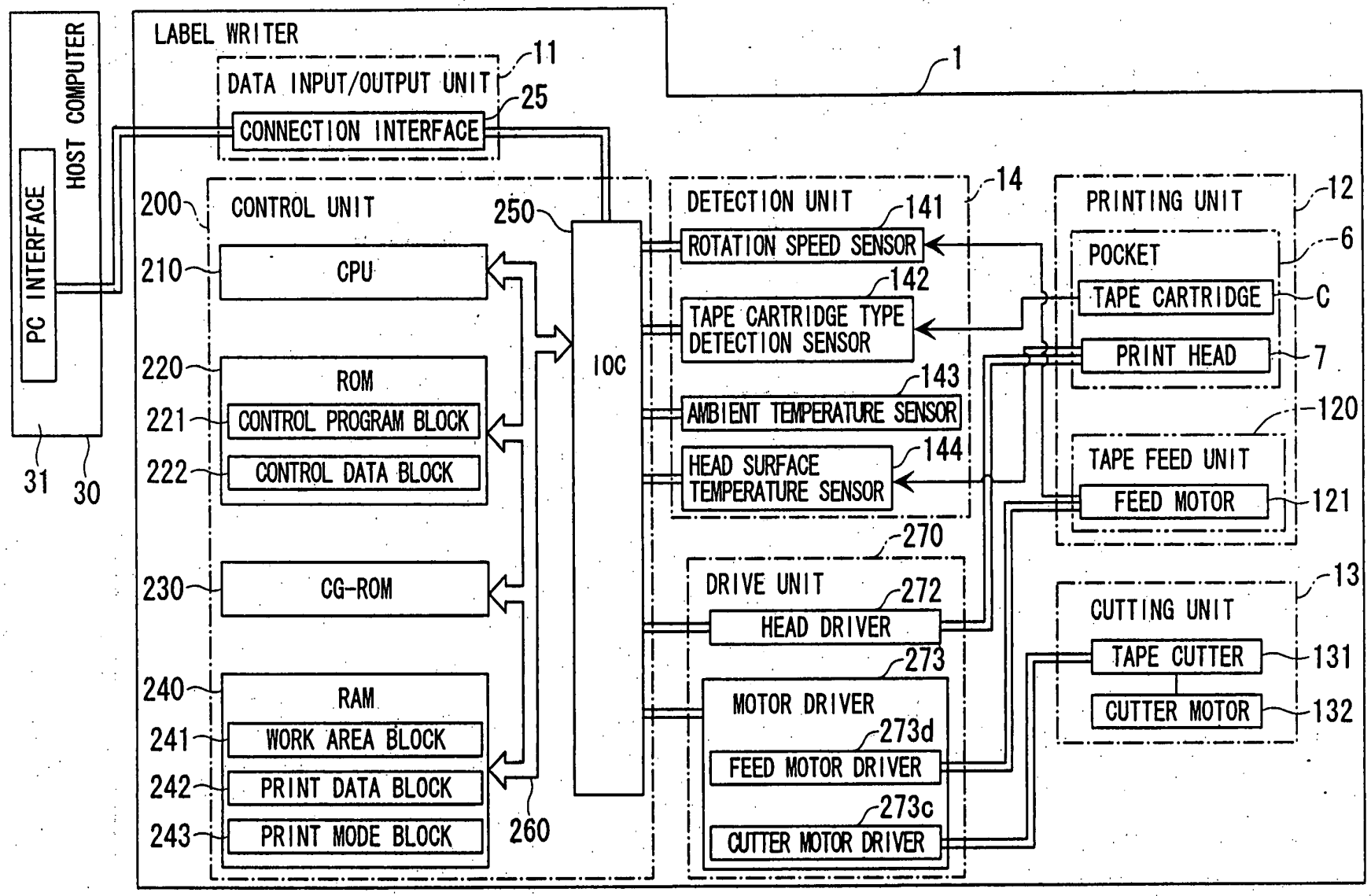

HOST COMPUTER
PC INTERFACE
31
30
LABEL WRITER
1
DATA INPUT/OUTPUT UNIT
11
CONNECTION INTERFACE
25
CONTROL UNIT
200
CPU
210
ROM
220
CONTROL PROGRAM BLOCK
221
CONTROL DATA BLOCK
222
CG-ROM
230
RAM
240
WORK AREA BLOCK
241
PRINT DATA BLOCK
242
PRINT MODE BLOCK
243
250
IOC
260
DETECTION UNIT
14
ROTATION SPEED SENSOR
141
TAPE CARTRIDGE TYPE DETECTION SENSOR
142
AMBIENT TEMPERATURE SENSOR
143
HEAD SURFACE TEMPERATURE SENSOR
144
DRIVE UNIT
270
HEAD DRIVER
272
MOTOR DRIVER
273
FEED MOTOR DRIVER
273d
CUTTER MOTOR DRIVER
273c
PRINTING UNIT
12
POCKET
6
TAPE CARTRIDGE
C
PRINT HEAD
7
TAPE FEED UNIT
120
FEED MOTOR
121
CUTTING UNIT
13
TAPE CUTTER
131
CUTTER MOTOR
132

FIG. 4

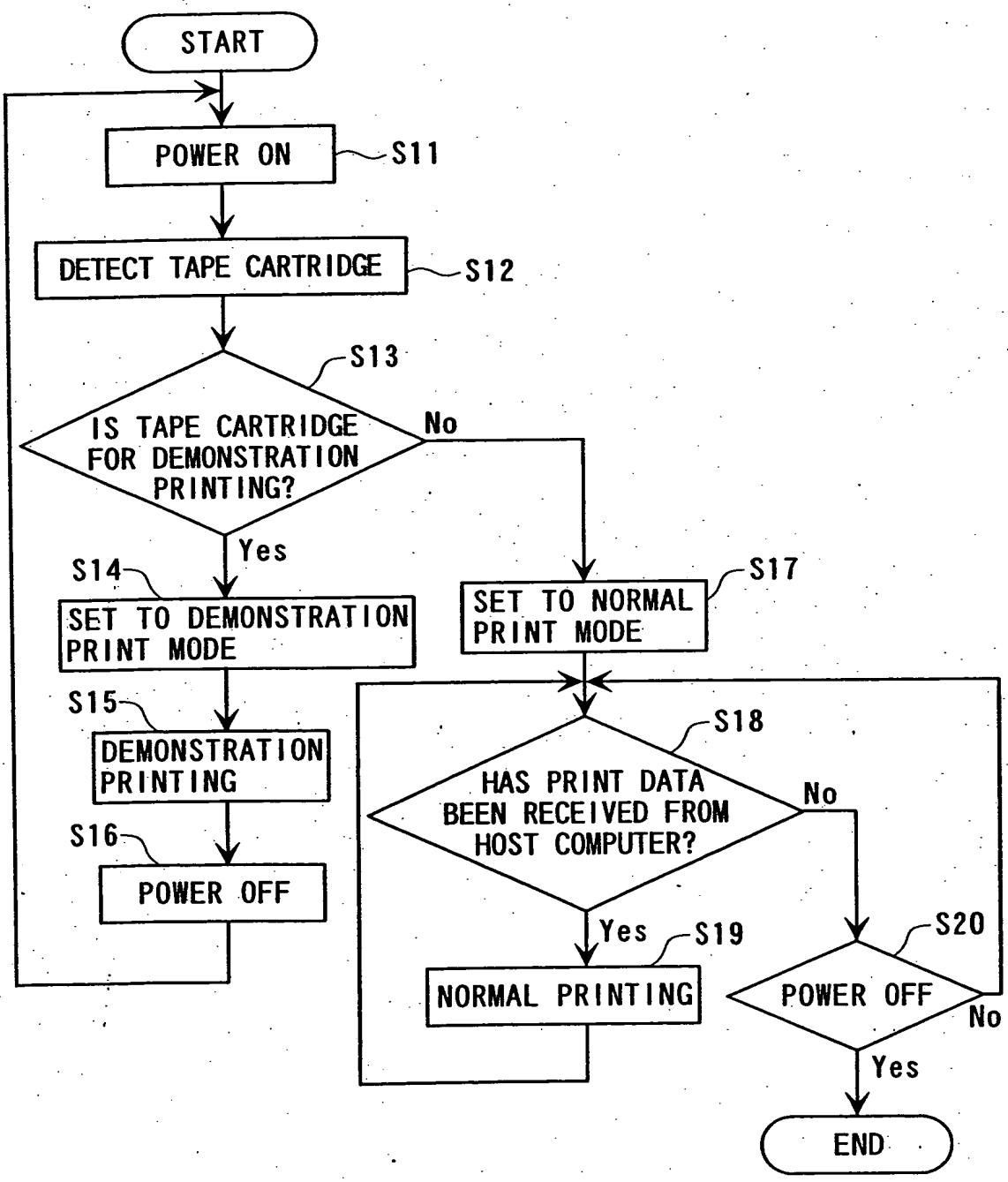

START
POWER ON
S11
DETECT TAPE CARTRIDGE
S12
S13
IS TAPE CARTRIDGE FOR DEMONSTRATION PRINTING?
No
Yes
S14
SET TO DEMONSTRATION PRINT MODE
S15
DEMONSTRATION PRINTING
S16
POWER OFF
S17
SET TO NORMAL PRINT MODE
S18
HAS PRINT DATA BEEN RECEIVED FROM HOST COMPUTER?
No
Yes
S19
NORMAL PRINTING
S20
POWER OFF
No
Yes
END

FIG. 5

〈MODE SETTING CONDITIONS〉

DEPENDING ON PRINT MEDIUM (a)

	CONDITION	MODE
T-1	WHEN PRINT MEDIUM IS SPECIFIC(TAPE CARTRIDGE EXCLUSIVELY USED FOR DEMONSTRATION PRINTING)	DEMONSTRATION PRINT MODE
T-2	WHEN PRINT MEDIUM IS SPECIFIC(TAPE CARTRIDGE EXCLUSIVELY USED FOR NORMAL PRINTING)	NORMAL PRINT MODE

DEPENDING ON CONNECTION OBJECT (b)

	CONDITION	MODE
C-1	WHEN CONNECTION OBJECT IS NOT HOST COMPUTER OR WHEN THERE IS NO CONNECTION OBJECT	DEMONSTRATION PRINT MODE
C-2	WHEN CONNECTION OBJECT IS ATTACHMENT EXCLUSIVELY USED FOR DEMONSTRATION PRINTING	DEMONSTRATION PRINT MODE
C-3	WHEN CONNECTION OBJECT IS HOST COMPUTER	NORMAL PRINT MODE

DEPENDING ON CONNECTION OBJECT AND PRINT MEDIUM CONDITION (c)

	CONDITION	MODE
CT-1	WHEN CONNECTION OBJECT IS HOST COMPUTER(IRRESPECTIVE OF LOADED PRINT MEDIUM)	NORMAL PRINT MODE
CT-2	WHEN CONNECTION OBJECT IS ATTACHMENT EXCLUSIVELY USED FOR DEMONSTRATION PRINTING (IRRESPECTIVE OF LOADED PRINT MEDIUM)	DEMONSTRATION PRINT MODE
CT-3	WHEN PRINT MEDIUM IS SPECIFIC PRINT MEDIUM(IRRESPECTIVE OF CONNECTION OBJECT)	DEMONSTRATION PRINT MODE

FIG. 6

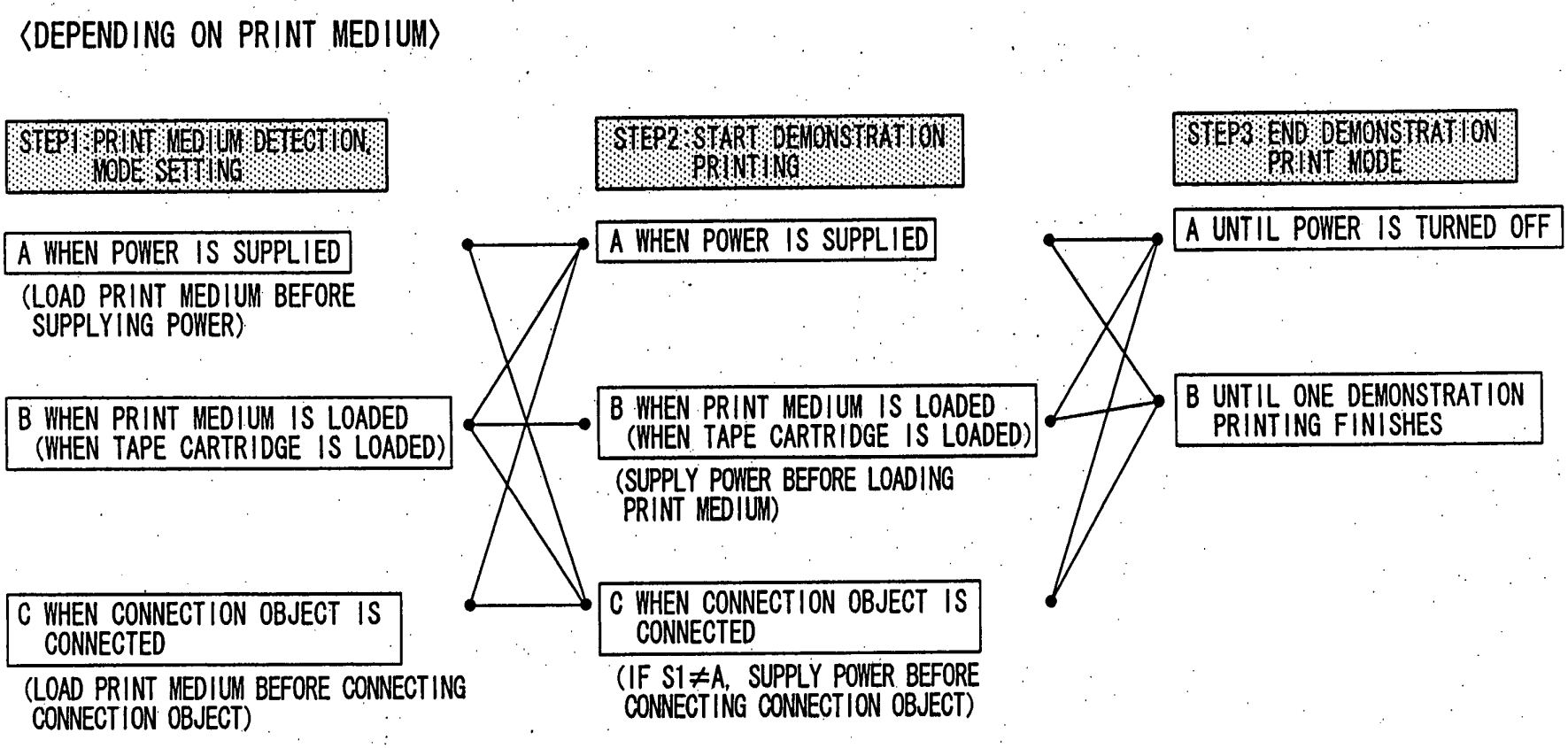

〈DEPENDING ON PRINT MEDIUM〉
STEP1 PRINT MEDIUM DETECTION MODE SETTING
A WHEN POWER IS SUPPLIED
(LOAD PRINT MEDIUM BEFORE SUPPLYING POWER)
B WHEN PRINT MEDIUM IS LOADED (WHEN TAPE CARTRIDGE IS LOADED)
C WHEN CONNECTION OBJECT IS CONNECTED
(LOAD PRINT MEDIUM BEFORE CONNECTING CONNECTION OBJECT)
STEP2 START DEMONSTRATION PRINTING
A WHEN POWER IS SUPPLIED
B WHEN PRINT MEDIUM IS LOADED (WHEN TAPE CARTRIDGE IS LOADED)
(SUPPLY POWER BEFORE LOADING PRINT MEDIUM)
C WHEN CONNECTION OBJECT IS CONNECTED
(IF S1≠A, SUPPLY POWER BEFORE CONNECTING CONNECTION OBJECT)
STEP3 END DEMONSTRATION PRINT MODE
A UNTIL POWER IS TURNED OFF
B UNTIL ONE DEMONSTRATION PRINTING FINISHES

FIG. 7

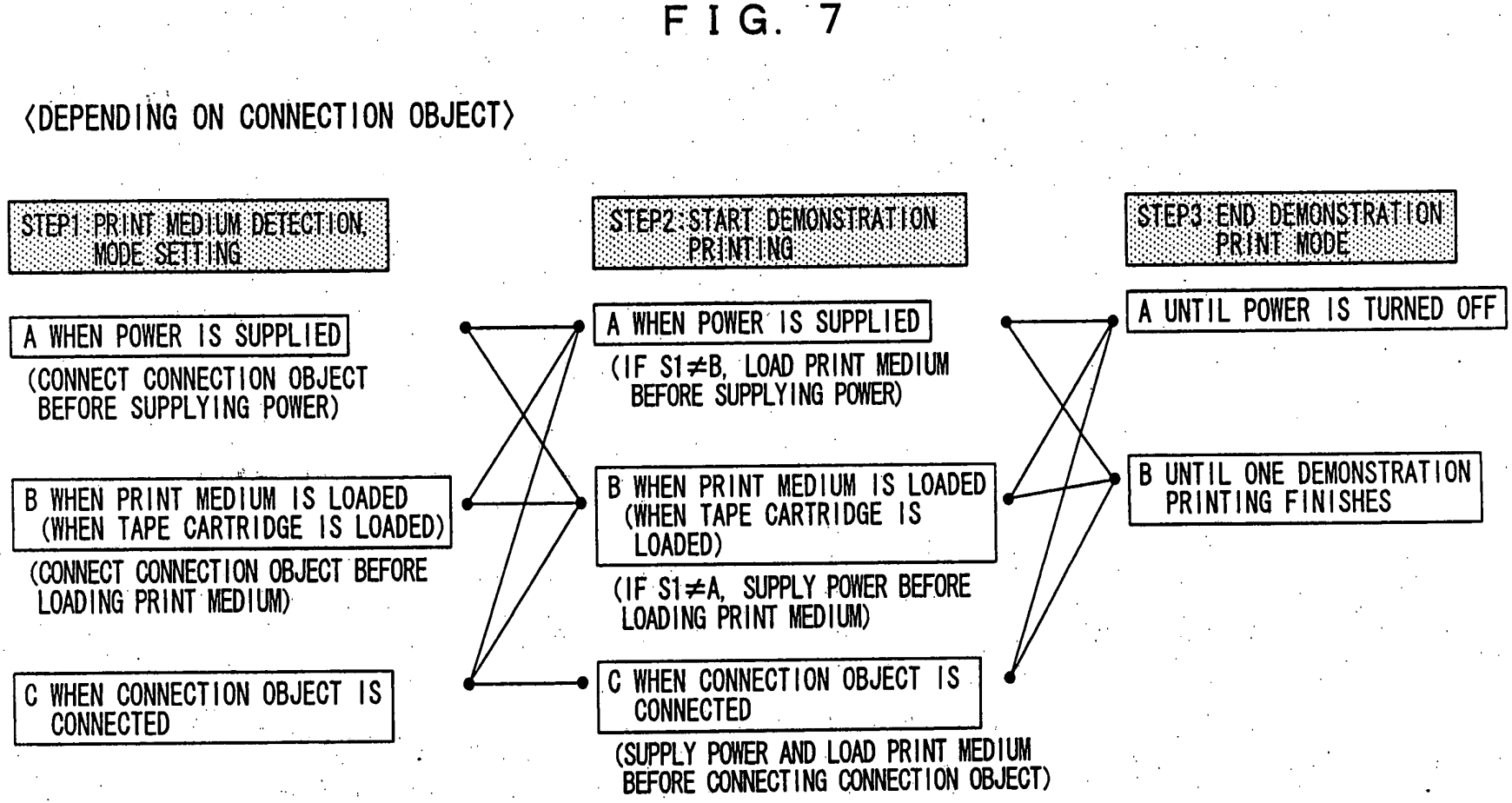

〈DEPENDING ON CONNECTION OBJECT〉
STEP1 PRINT MEDIUM DETECTION MODE SETTING
A WHEN POWER IS SUPPLIED
(CONNECT CONNECTION OBJECT BEFORE SUPPLYING POWER)
B WHEN PRINT MEDIUM IS LOADED (WHEN TAPE CARTRIDGE IS LOADED)
(CONNECT CONNECTION OBJECT BEFORE LOADING PRINT MEDIUM)
C WHEN CONNECTION OBJECT IS CONNECTED
STEP2 START DEMONSTRATION PRINTING
A WHEN POWER IS SUPPLIED
(IF S1≠B, LOAD PRINT MEDIUM BEFORE SUPPLYING POWER)
B WHEN PRINT MEDIUM IS LOADED (WHEN TAPE CARTRIDGE IS LOADED)
(IF S1≠A, SUPPLY POWER BEFORE LOADING PRINT MEDIUM)
C WHEN CONNECTION OBJECT IS CONNECTED
(SUPPLY POWER AND LOAD PRINT MEDIUM BEFORE CONNECTING CONNECTION OBJECT)
STEP3 END DEMONSTRATION PRINT MODE
A UNTIL POWER IS TURNED OFF
B UNTIL ONE DEMONSTRATION PRINTING FINISHES

FIG. 8

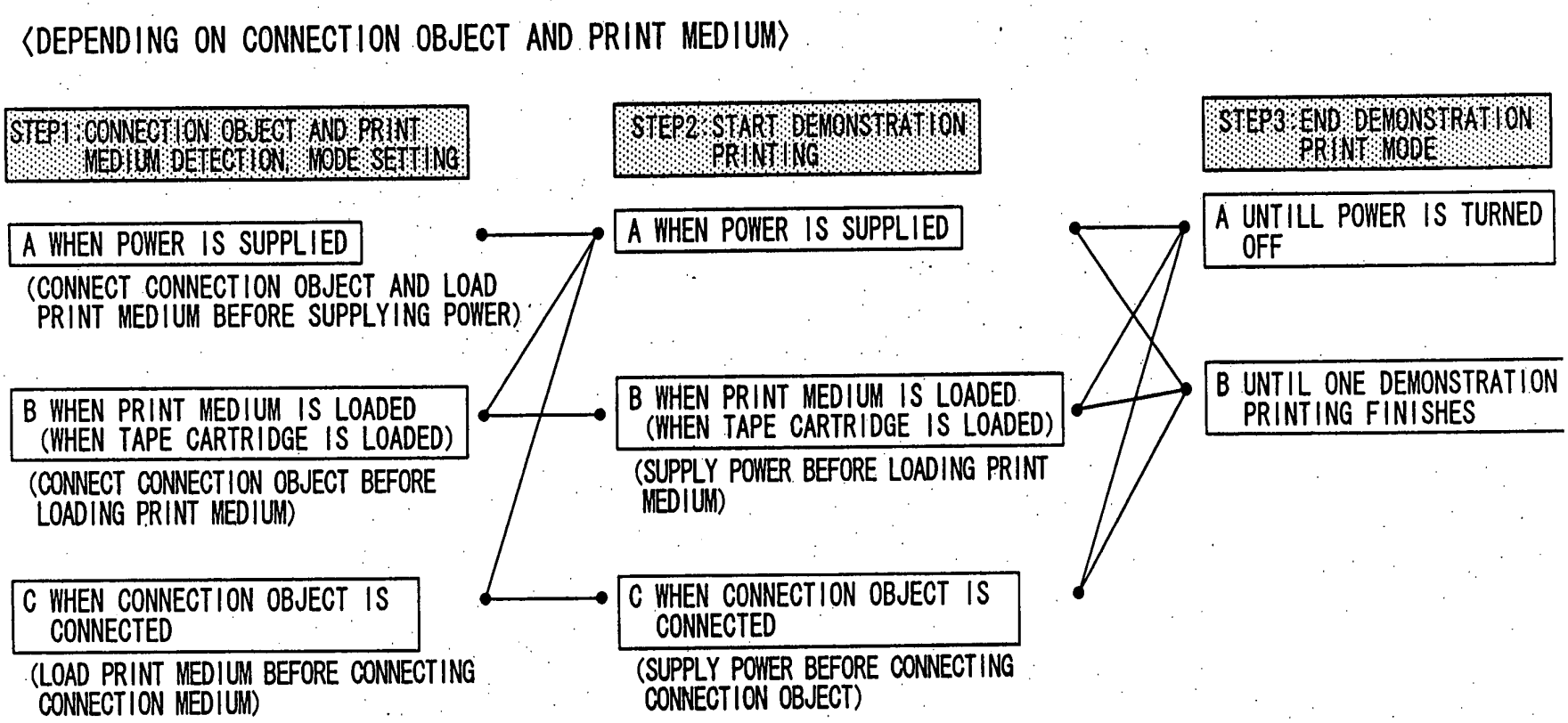

〈DEPENDING ON CONNECTION OBJECT AND PRINT MEDIUM〉
STEP1 CONNECTION OBJECT AND PRINT MEDIUM DETECTION MODE SETTING
STEP2 START DEMONSTRATION PRINTING
STEP3 END DEMONSTRATION PRINT MODE
A WHEN POWER IS SUPPLIED
(CONNECT CONNECTION OBJECT AND LOAD PRINT MEDIUM BEFORE SUPPLYING POWER)
B WHEN PRINT MEDIUM IS LOADED (WHEN TAPE CARTRIDGE IS LOADED)
(CONNECT CONNECTION OBJECT BEFORE LOADING PRINT MEDIUM)
C WHEN CONNECTION OBJECT IS CONNECTED
(LOAD PRINT MEDIUM BEFORE CONNECTING CONNECTION MEDIUM)
A WHEN POWER IS SUPPLIED
B WHEN PRINT MEDIUM IS LOADED (WHEN TAPE CARTRIDGE IS LOADED)
(SUPPLY POWER BEFORE LOADING PRINT MEDIUM)
C WHEN CONNECTION OBJECT IS CONNECTED
(SUPPLY POWER BEFORE CONNECTING CONNECTION OBJECT)
A UNTILL POWER IS TURNED OFF
B UNTIL ONE DEMONSTRATION PRINTING FINISHES

FIG. 9

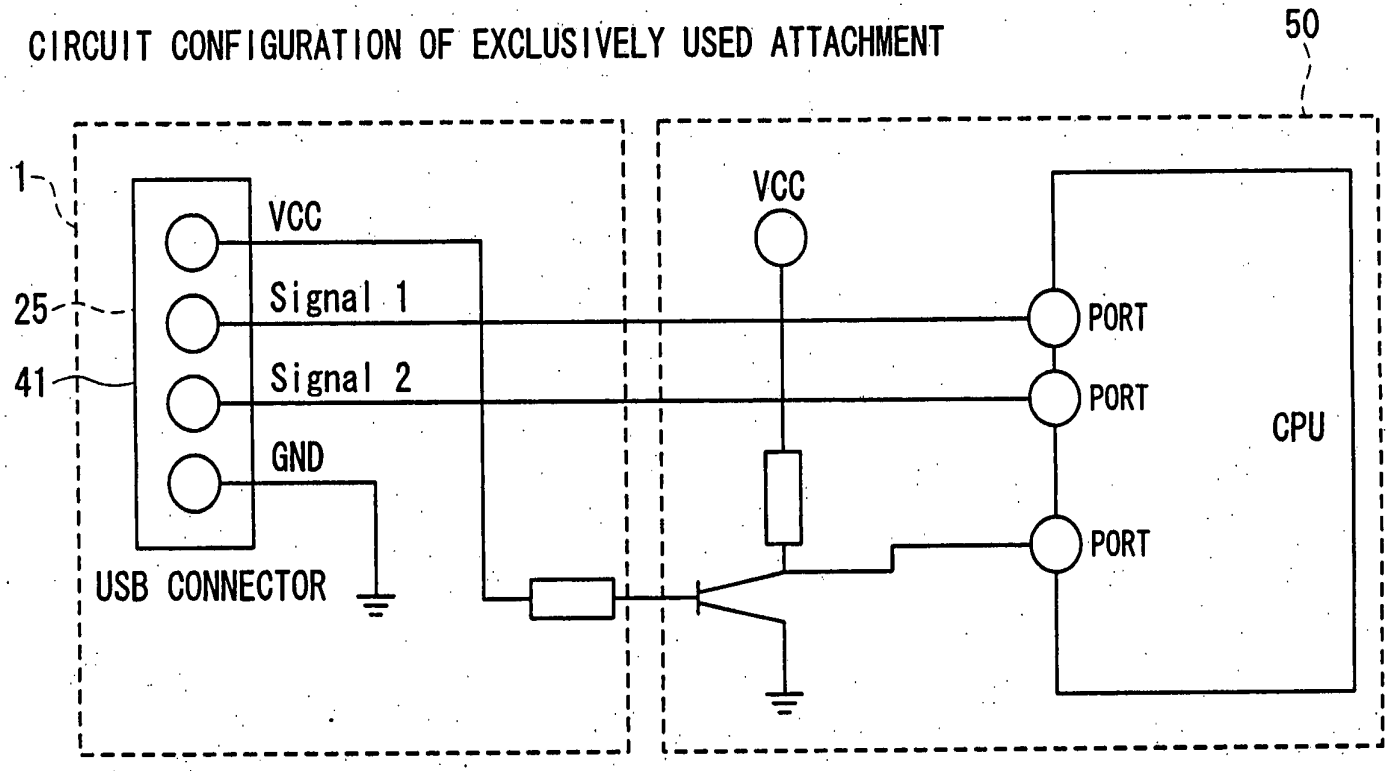

CIRCUIT CONFIGURATION OF EXCLUSIVELY USED ATTACHMENT
50
1
25
41
VCC
Signal 1
Signal 2
GND
USB CONNECTOR
VCC
PORT
PORT
PORT
CPU

FIG. 10

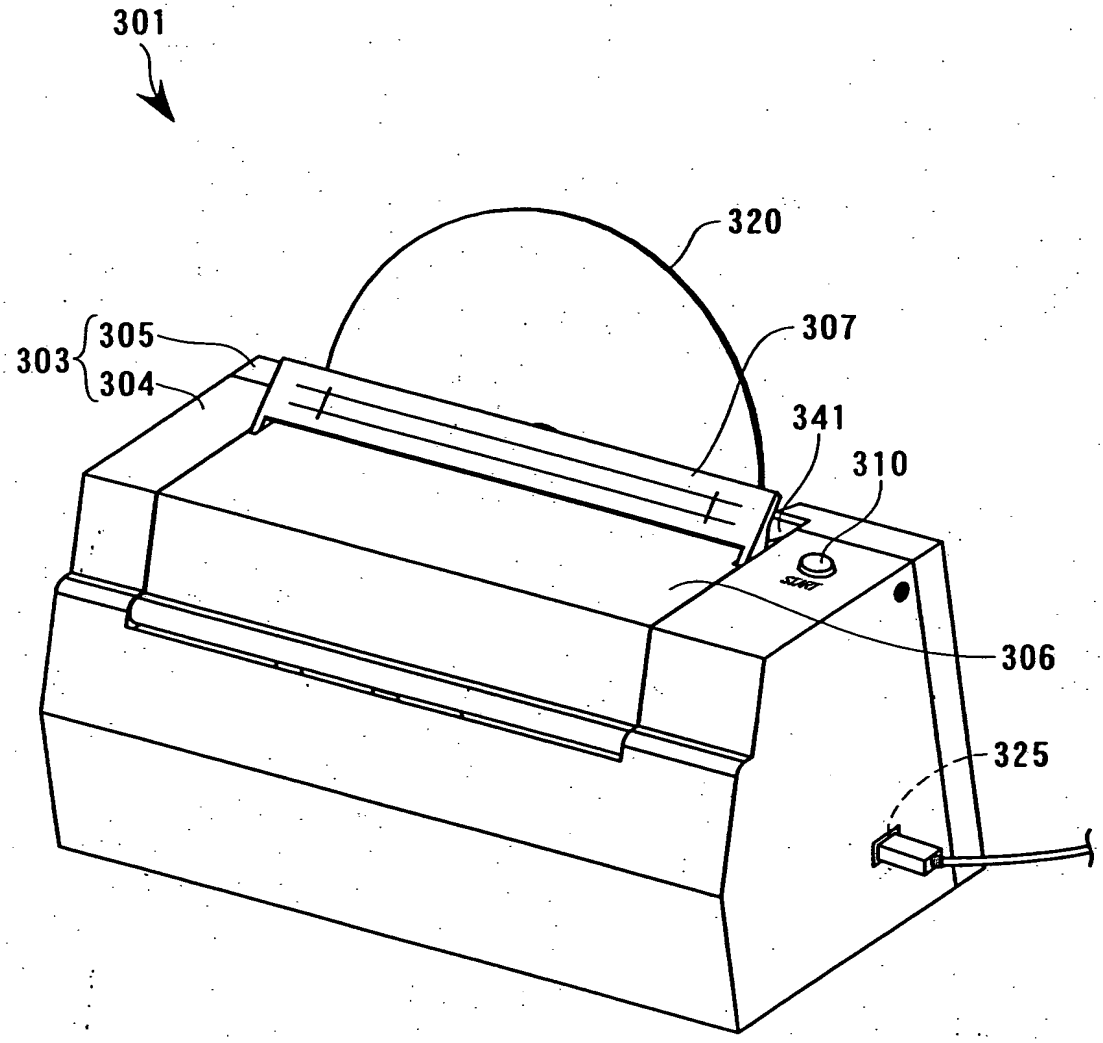


FIG. 11

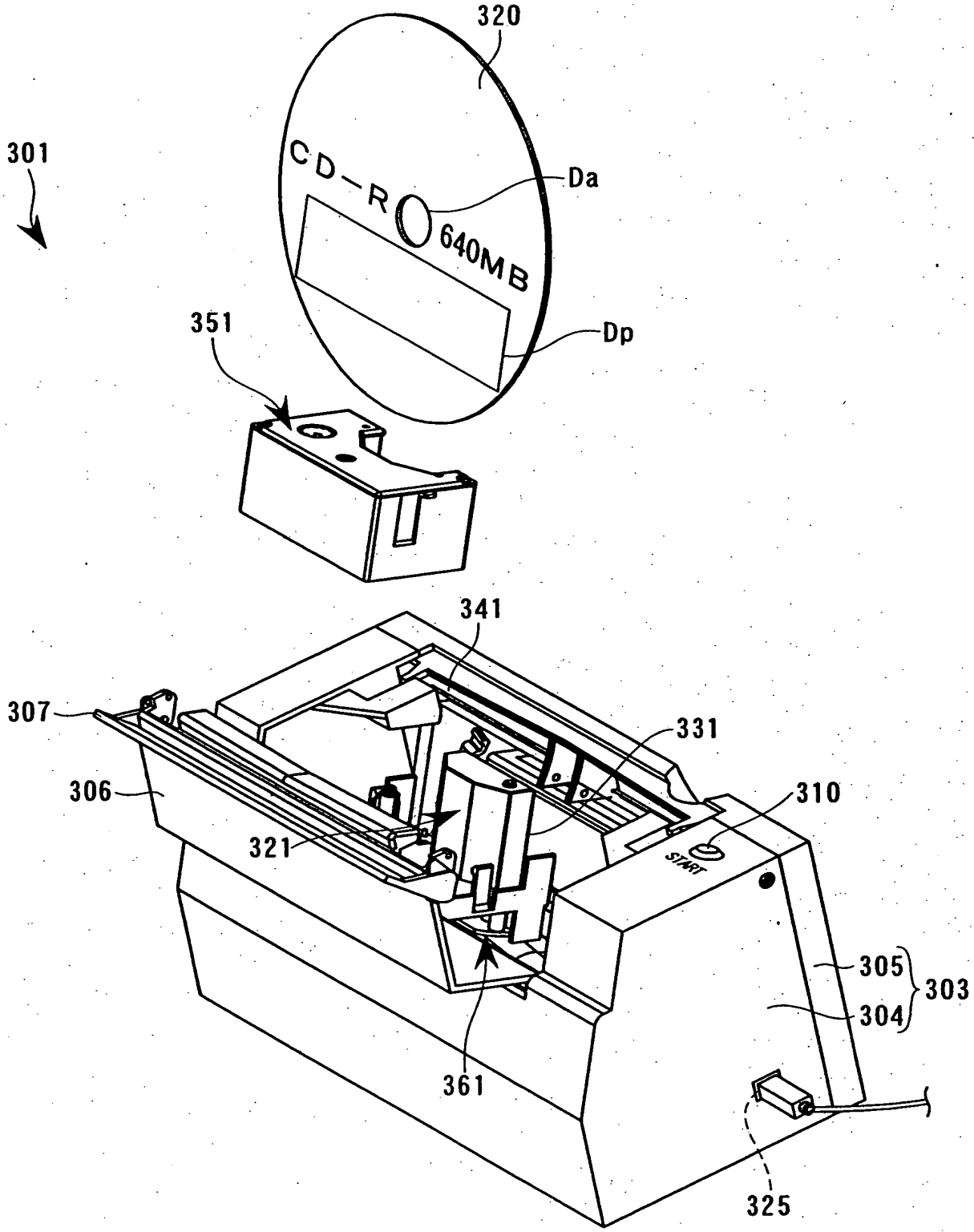
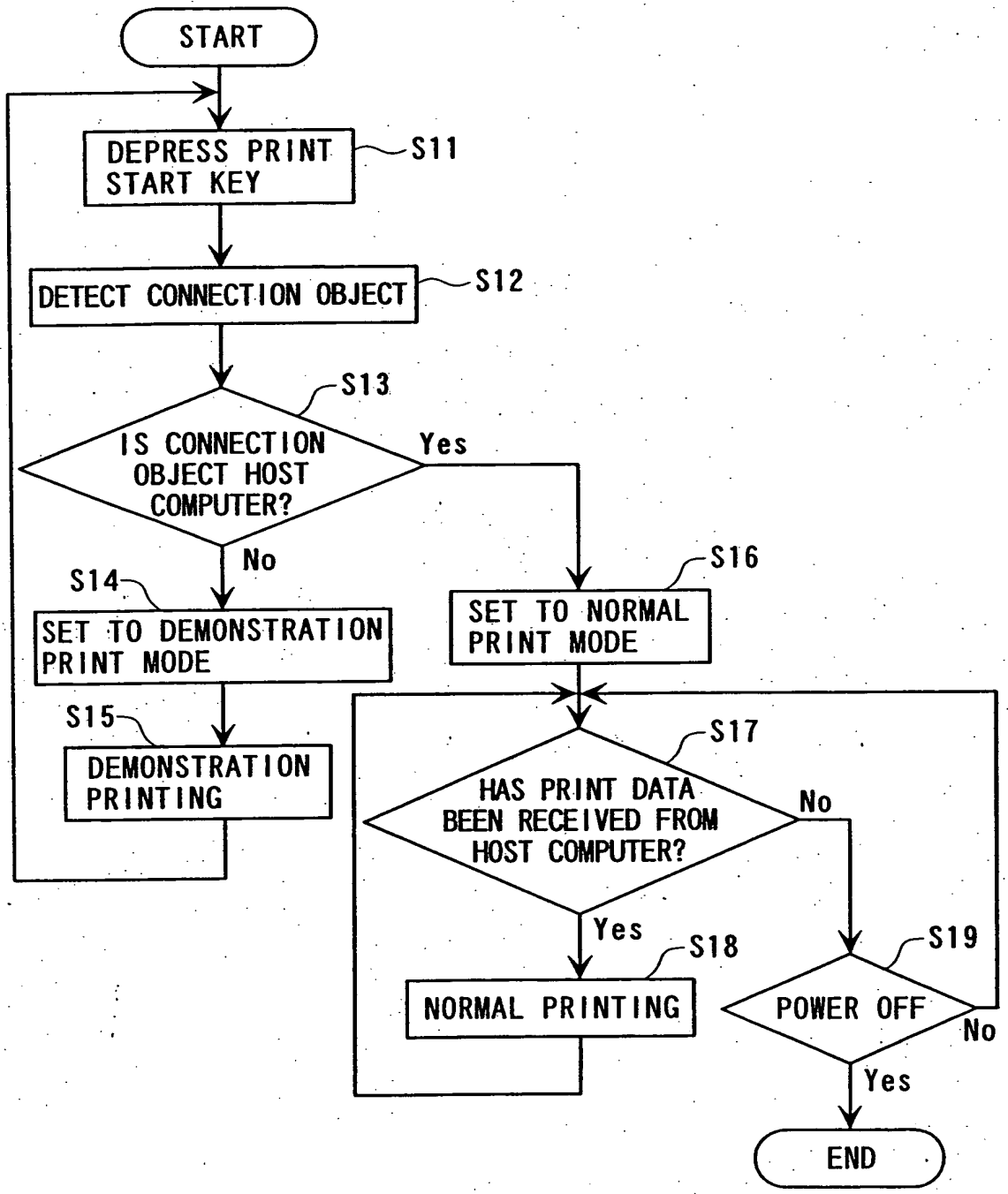

320
301
CD-R
640MB
Da
Dp
351
341
307
331
306
310
321
START
305
303
304
361
325

FIG. 12


START
DEPRESS PRINT START KEY
S11
DETECT CONNECTION OBJECT
S12
S13
IS CONNECTION OBJECT HOST COMPUTER?
Yes
No
S14
SET TO DEMONSTRATION PRINT MODE
S15
DEMONSTRATION PRINTING
S16
SET TO NORMAL PRINT MODE
S17
HAS PRINT DATA BEEN RECEIVED FROM HOST COMPUTER?
No
Yes
S18
NORMAL PRINTING
S19
POWER OFF
No
Yes
END